

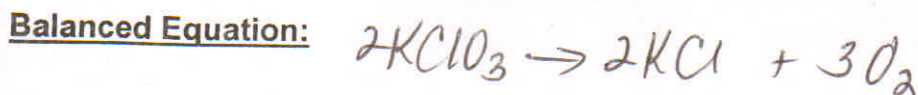
Mixed Stoichiometry Practice

Name Key

Date _____ Period _____

Write and/or balance the following equations (remember the diatomic elements and to criss-cross charges for ionic compounds!!!) Use the mole ratios from the balanced equations to solve the following stoichiometry problems. Use units and labels in all conversions, and round your answer to sig figs.

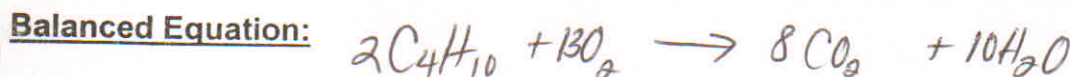
1. Potassium chlorate decomposes into potassium chloride and oxygen gas.



2. How many moles of oxygen are produced when 3.0 moles of potassium chlorate decompose completely?

$$3.0 \text{ mol KClO}_3 \left(\frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} \right) = \boxed{4.5 \text{ mol O}_2}$$

3. Butane (C_4H_{10}) undergoes combustion.



4. How many grams of CO_2 are produced when 88 g of O_2 are reacted with an excess of butane?

$$88 \text{ g O}_2 \left(\frac{1 \text{ mol O}_2}{32 \text{ g O}_2} \right) \left(\frac{8 \text{ mol CO}_2}{13 \text{ mol O}_2} \right) \left(\frac{44 \text{ g CO}_2}{1 \text{ mol CO}_2} \right) = 74.46 \dots \rightarrow \boxed{74 \text{ g CO}_2}$$

5. Water decomposes into hydrogen gas and oxygen gas by electrolysis.



6. How many grams of hydrogen will be produced when 6.0 moles of oxygen are produced?

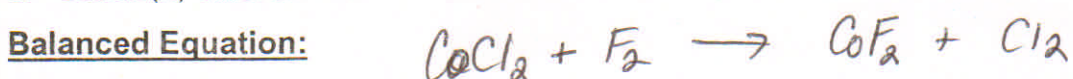
$$6.0 \text{ mol O}_2 \left(\frac{2 \text{ mol H}_2}{1 \text{ mol O}_2} \right) \left(\frac{2 \text{ g}}{1 \text{ mol H}_2} \right) = \boxed{24 \text{ g H}_2}$$

7. How many water molecules are required to produce 9.00 grams of hydrogen?

$$9.00 \text{ g H}_2 \left(\frac{1 \text{ mol H}_2}{2 \text{ g H}_2} \right) \left(\frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2} \right) \left(\frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol H}_2\text{O}} \right) = \boxed{2.71 \times 10^{24} \text{ molecules H}_2\text{O}}$$

8. Cobalt(II) chloride reacts with fluorine

Balanced Equation:

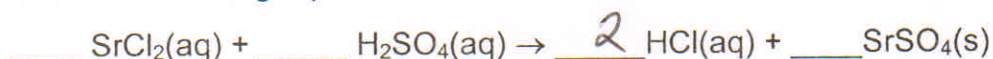


9. How many grams of fluorine are required to produce 290.8 g of cobalt(II) fluoride?

$$290.8 \text{ g CoF}_2 \left(\frac{1 \text{ mol CoF}_2}{96.9 \text{ g CoF}_2} \right) \left(\frac{1 \text{ mol F}_2}{1 \text{ mol CoF}_2} \right) \left(\frac{38 \text{ g F}_2}{1 \text{ mol F}_2} \right) =$$

$$114.0 \text{ g F}_2$$

10. Balance the following equation.

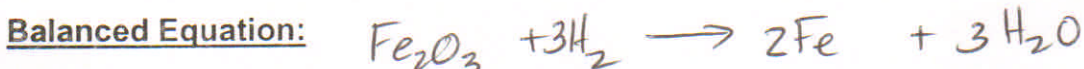


11. What is the mass of strontium chloride that reacts with 300.0 g of sulfuric acid?

$$300.0 \text{ g H}_2\text{SO}_4 \left(\frac{1 \text{ mol H}_2\text{SO}_4}{98.1 \text{ g H}_2\text{SO}_4} \right) \left(\frac{1 \text{ mol SrCl}_2}{1 \text{ mol H}_2\text{SO}_4} \right) \left(\frac{158.6 \text{ g SrCl}_2}{1 \text{ mol SrCl}_2} \right) = 4.85 \text{ g SrCl}_2$$

12. Solid iron(III) oxide reacts with hydrogen gas to form iron and water.

Balanced Equation:



13. How many grams of iron are produced when 450 grams of iron(III) oxide are reacted?

$$450 \text{ g Fe}_2\text{O}_3 \left(\frac{1 \text{ mol Fe}_2\text{O}_3}{159.6 \text{ g Fe}_2\text{O}_3} \right) \left(\frac{2 \text{ mol Fe}}{1 \text{ mol Fe}_2\text{O}_3} \right) \left(\frac{55.8 \text{ g Fe}}{1 \text{ mol Fe}} \right) = 314.66 \text{ g Fe} \rightarrow 310 \text{ g Fe}$$

14. How many grams of water will be produced when 0.0155 moles of hydrogen gas react completely with iron(III) oxide?

$$0.0155 \text{ mol H}_2 \left(\frac{3 \text{ mol H}_2\text{O}}{3 \text{ mol H}_2} \right) \left(\frac{18 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} \right) = 0.279 \text{ g H}_2\text{O}$$